

REMARKS

As an initial matter, Applicants respectfully request that the Examiner acknowledge whether or not the replacement drawings submitted by the Applicant on June 15, 2005 are acceptable.

Claims 1-21, 26 and 34-52 were previously canceled. Claim 23 has been canceled. Claim 22 has been amended to include the limitations previously found in claim 23; claims 24-25 have been amended to correct their dependencies. The limitations of claim 55 have been clarified. Accordingly, claims 22, 24-25, 27-33 and 53-58 are pending. The foregoing amendments should put the claim in condition for allowance, and do not contain additional subject matter that would require further search. Entry of these amendments is therefore requested. Reconsideration and withdrawal of all outstanding rejections are also requested in light of the foregoing amendments and the following remarks.

Claims 55 and 56 stand rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement. In light of the foregoing amendment, reconsideration is requested. Claim 55 has been amended to clarify its limitations. Support for the amendment can be found, for example, in Fig. 4 and paragraph [0028] in the application as originally filed.

Claims 23-33 stand rejected under 35 USC 102(e) as being anticipated by U.S. Patent Not. 6,859,227 to Andersson et al. ("Andersson"). The rejection is traversed.

The present invention relates to methods of forming and operating a shutter frame pixel and/or pixel array. The invention attempts to solve shutter pixel inefficiency problems by isolating a charge storage node and not allowing it to integrate charge. As such, claim 22 recites a method of operation including transferring from photoreceptors a photoelectrically induced signal to "respective separated storage node[s] located within a semiconductor well region formed in the semiconductor substrate; and preventing said

separated storage node from integrating charge.” Thus, the claimed invention has a signal storage region formed in a well region in a substrate.

Andersson also relates to improving frame shutter pixels. Andersson, however, teaches various circuits and timing techniques to eliminate the fixed pattern noise that plagues traditional frame shutter pixels. Andersson does not show or teach that the storage node is “located within a semiconductor well region,” as in the claimed invention. Andersson provides no teaching regarding the pixel inefficiency problem that the present invention solves.

For at least these reasons, withdrawal of the rejection is respectfully requested. Each of claims 24-25 and 27-33 depend from claim 22 and contain all of the limitations recited therein. These claims are also allowable.

Claims 53-55 and 58 stand rejected under 35 USC 103(a) as being unpatentable over U.S. Patent Pub. No. 2002/0022295 (“Pan”) in view of U.S. Patent No. 6,498,622 to Nakashiba (“Nakashiba”), or alternatively over Pan in view of WO 97/28558 to Fossum. Both rejections are traversed.

With reference to FIG. 7 of Pan, the Office Action relies on region 44 as teaching the claimed “storage region located in the first well region, the storage region for collecting charge generated by the photosensor and being doped to a second conductivity type”. The region 44 in Pan is not a charge storage region. In addition, because of this region 44, Pan shows a photosensor 42 being in electrical connection to a well region 34. Therefore, Pan does not teach or suggest the claimed method comprising “forming a first well region in the substrate, the first well region being separated from the photosensor.”

Thus, the teachings of Pan are inadequate to anticipate the claimed invention. Further, neither Fossum nor Nakashiba cure these deficiencies. Whether considered alone or in combination, the references do not teach all of the limitations recited by independent claim 53 and claims 54-57, dependent therefrom. Further, the references do not provide

an objective motivation to combine the reference teachings as suggested by the Office Action. Rather, the Office Action applies impermissible hindsight in view of the teachings of the present application. For at least these reasons, the claimed invention, as embodied by independent claim 53 should be allowable over the cited references.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. According, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

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